Software for Optimizing Plans Involving Interdependent Goals

A computer program enables construction and optimization of plans for activities that are directed toward achievement of goals that are interdependent. Goal interdependence is defined as the achievement of one or more goals affecting the desirability or priority of achieving one or more other goals. This program is overlaid on the Automated Scheduling and Planning Environment (ASPEN) software system, aspects of which have been described in a number of prior NASA Tech Briefs articles. Unlike other known or related planning programs, this program considers interdependences among goals that can change between problems and provides a language for easily specifying such dependences. Specifications of the interdependences can be formulated dynamically and provided to the associated planning software as part of the goal input. Then an optimization algorithm provided by this program enables the planning software to reason about the interdependences and incorporate them into an overall objective function that it uses to rate the quality of a plan under construction and to direct its optimization search. In tests on a series of problems of planning geological experiments by a team of instrumented robotic vehicles (rovers) on new terrain, this program was found to enhance plan quality.

This program was written by Marco Quadrelli of Caltech for NASA’s Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (818) 393-2827. Refer to NPO-40651.

Custom Sky-Image Mosaics From NASA’s Information Power Grid

yourSkyG is the second generation of the software described in “yourSky: Custom Sky-Image Mosaics via the Internet” (NPO-30556), NASA Tech Briefs, Vol. 27, No. 6 (June 2003), page 45. Like its predecessor, yourSkyG supplies custom astronomical image mosaics of sky regions specified by requesters using client computers connected to the Internet. Whereas yourSky constructs mosaics on a local multiprocessor system, yourSkyG performs the computations on NASA’s Information Power Grid (IPG), which is capable of performing much larger mosaicking tasks. (The IPG is high-performance computation and data grid that integrates geographically distributed...